

**TRIBAL RESOURCE MANAGEMENT PLAN 4(d) RULE  
PROPOSED EVALUATION AND PENDING DETERMINATION**

**Title of TRMP:** Tribal Resource Management Plan for Snake River  
Spring/Summer Chinook Salmon in the Imnaha River Subbasin in  
2003

**TRMP Provided by:** The Nez Perce Tribe

**Action Area:** Imnaha River subbasin, Oregon

**ESU:** Snake River spring/summer chinook salmon

**4(d) Rule Limit:** Tribal 4(d) Rule [50 CFR 223.209]

**NMFS Tracking Number:** NWR/4d/14/2003/001

**Date:**

**BACKGROUND**

**The Tribal 4(d) Rule**

On March 26, 2003, the National Marine Fisheries Service (NOAA Fisheries) received an Imnaha River spring/summer chinook salmon Tribal Resource Management Plan (TRMP) from the Nez Perce Tribe (NPT). This TRMP was submitted to NOAA Fisheries under the government-to-government processes established in the final 4(d) rule for TRMPs (July 10, 2000, 65 FR 42482 [50 CFR 223.209]). This process requires that before any TRMP qualifies for a limitation on the application of take prohibitions for threatened species, NOAA Fisheries must determine that it will not appreciably reduce the likelihood of the listed species survival and recovery. NOAA Fisheries must draft a Proposed Evaluation and Pending Determination regarding the TRMP in the Federal Register for public comment and then take any comments into account in making a final determination.

Pacific salmon populations fluctuate from year to year, but over the long term (since at least the early 1900s), streams and rivers have been producing fewer and fewer fish, eventually prompting Federal listing of many distinct groups of salmon and steelhead up and down the West Coast under the Endangered Species Act (ESA). Snake River spring/summer chinook salmon, including Imnaha River populations, received Federal protection under the ESA in 1992 (April 22, 1992, 57 FR 14653). In response to these listings, the NOAA Fisheries issued a final Rule

under ESA section 4(d) establishing and modifying the application of section 9 take prohibitions for threatened salmon and steelhead (50 CFR 223.209) with respect to certain tribal programs. The rule establishes a limitation on ESA take prohibitions for TRMPs where the Secretary of Commerce has determined that implementing the TRMP will not appreciably reduce the likelihood of survival and recovery of the listed species. The Rule also reiterated that the United States has a unique legal relationship with Indian Tribes as set forth in the Constitution, treaties, statutes, executive orders, and court decisions, and established a process to meet the conservation needs of protected species while respecting tribal rights and meeting federal trust responsibilities.

The Imnaha River subbasin is located within the Snake River basin in northeastern Oregon (Figure 1). This portion of Oregon is within the ceded area of the NPT. The Tribe and the State of Oregon have joint management responsibility for chinook salmon in the Imnaha River, which are also under the continuing jurisdiction of *U.S. v. Oregon*, the ongoing Federal court proceeding to implement and enforce reserved treaty fishing rights.

Following a *U.S. v. Oregon* dispute resolution in 1993, the NPT and the Oregon Department of Fish and Wildlife (ODFW) cooperatively developed propagation and harvest management programs to help restore Imnaha River spring/summer chinook salmon. The program is experimenting with protected chinook salmon to enhance salmon production in the Imnaha River subbasin and is currently covered under ESA section 10 (a)(1)(A) permit #1128 (NMFS 2000). The program's objectives, as described in the permit, are: (1) to restore naturally spawning populations of chinook salmon in the Imnaha River subbasin to ESA delisting levels, (2) to reestablish traditional tribal and recreational fisheries for chinook salmon, (3) to maintain the genetic and life history characteristics of the endemic wild population while pursuing mitigation goals and management objectives, and (4) to operate the program to ensure that the genetic and life history characteristics of the hatchery fish mimic those of the wild fish as closely as possible. To realize these objectives, a sliding scale developed by the NPT and ODFW sets criteria for managing adult chinook salmon returning to the Imnaha River weir (Table 1; Table 2).

Table 1. Sliding scale allocation for spring/summer chinook salmon returning to the Imnaha River at the Gumboot Weir (ODFW 1998).

Estimated total adult escapement to the Imnaha River mouth	Ratio of hatchery to natural adults at the mouth	Maximum % natural adults to retain for broodstock	Maximum % hatchery adults to retain for broodstock	Maximum % adults of hatchery released above the weir	Minimum % of broodstock of natural origin
<51	Any	0	0	a	NA
51-700	Any	50	50	a	a
701-1000	Any	40	a	70	20
1001-1400	Any	40	a	60	25
>1400	Any	30	a	50	30

NA – Not applicable.

a – Percentages determined as a result of implementing other criteria, therefore not a decision factor.

Table 2. Imnaha spring/summer chinook salmon management guidelines (ODFW 1998).

Escapement Level	Start Captive Brood Program	Collect for hatchery broodstock and spawn	Release to spawn naturally above weir	Outplant (hatchery fish only) to Big Sheep, Lick Creeks, and other habitat	Harvest for Tribal Ceremonial Use	Harvest for Tribal Subsistence	Constraints on % of hatchery or natural for release or broodstock	Recreational Harvest
<300 for 2 consecutive years*	Yes	No	No	No	**	**	No	No
51-700	No	Yes	Yes	No	Yes	**	No	No
>700 (see criteria below)	No	Yes	Yes	Yes	Yes	Yes	Yes	**

Criteria and Priorities for fish trapped at the weir:

- Retain natural adults at the maximum allowable percentage defined in the sliding scale up to that needed to achieve the egg take goal of 576,500 green eggs.
- Retain hatchery adults to meet broodstock needs at the rate equal to the number allowable to meet the minimum percentage of broodstock that must be natural origin. Spawn all fish that are collected for broodstock.
- Do not retain more than 320 (160 females and 160 males) adults for combined natural and hatchery broodstock.
- Release hatchery fish above the weir up to the rate equal to the percentage of adults released above the weir that can be hatchery origin.
- Hatchery fish that are excess to what is needed for broodstock and releases above the weir will be outplanted to Big Sheep and Lick Creek or harvested.
- No more than 10% of males placed above the weir will be hatchery origin jacks. All other hatchery jacks will be spawned with the total hatchery jack contribution to fertilization not to exceed 10% of the eggs.

\*Co-managers would submit a modification to the existing permit application to initiate a captive broodstock component for the Imnaha program.

\*\* Decision would be made on a case-by-case basis.

## Projected Imnaha River subbasin 2003 Salmon Return and Management Plan

The projected return in 2003 of natural-origin spring/summer chinook salmon to the Imnaha River is 1,540 fish (Table 3). This would be the 11th largest return in 46 years of record since 1957 (Table 4).

Table 3. Projected returns of spring/summer chinook salmon to the Imnaha River in 2003 (ODFW 2003).

	Adults	95% Confidence interval	Jacks	95% Confidence interval	Total
Hatchery origin	2,066	834-3,299	569	196-941	2,635
Natural origin	1,444	644-2,246	96	41-105	1,540
Total	3,510	1,478-5,545	665	237-1,091	4,175

The combined run of hatchery-origin and natural-origin chinook salmon is estimated to be 4,175 fish in 2003 (Table 3). This total is the fourth largest since 1957 when records were initiated and is only exceeded by the 2001 and 2002 runs since the propagation project began in 1982 (ODFW 2003a).

Table 4. Estimated annual return of naturally-produced spring/summer chinook salmon to the Imnaha River 1957-2002 (from ODFW 2002), and the 2003 projected return.

Year	Estimated Return	Year	Estimated Return
1957	4,391	1980*	125
1958	1,548	1981*	307
1959	874	1982	1,234
1960	2,070	1983	926
1961	1,280	1984	1,142
1962	1,382	1985	1,573
1963	755	1986	788
1964	1,380	1987	484
1965	1,048	1988	609
1966	1,261	1989	297
1967	1,203	1990	199
1968	1,420	1991	198
1969	1,683	1992	205
1970	976	1993	430
1971	2,049	1994	118
1972	1,884	1995	204
1973	3,061	1996	266
1974	1,529	1997	129
1975	823	1998	255
1976	701	1999	287
1977	871	2000	647
1978	2,291	2001	2,465
1979*	192	2002	1,190
		2003**	1,540

\* Estimates prior to 1982 are based on redd counts above the weir and are not expanded for those fish spawning below the weir location. Data sources: Parker (1997) and data from ODFW files, LaGrande office.

\*\* Preseason estimate

Recreational fishing was closed in the Imnaha between 1979 and 2000 due to low numbers of returning adult salmon and little or no tribal fishing occurred in most years. Declines to very low levels (redd counts in 1989, 1990, and 1991 were 40, 43, and 51, respectively) prompted the listing of these fish in 1992 under the ESA. Increasing survival in recent years credited to

favorable environmental conditions and to salmon recovery efforts prompted by ESA protections has lead to increasing salmon returns. Because of these increasing returns, the NPT and the State of Oregon conducted limited fisheries in the Imnaha River under TRMPs during 2001 and 2002. In each case, NOAA Fisheries concluded that the TRMPs planned harvest activities would not appreciably reduce the likelihood of survival and recovery of threatened Snake River spring/summer chinook salmon protected under the ESA.

Approximately 1,540 chinook salmon, progeny of fish that spawned in the Imnaha subbasin during 1998, 1999 and 2000, are expected to return in 2003 together with 2,635 chinook salmon from an experimental propagation program. Under these circumstances, the NPT and the State of Oregon are again planning for limited fisheries in 2003.

The NPT submitted a TRMP under the 4(d) Rule to NOAA Fisheries on March 25, 2003 (NPT 2003). Under agreement between the NPT and ODFW to coordinate the management of their fisheries in the Imnaha subbasin, both the tribal and recreational fisheries planned in 2003 have been analyzed and processed together under the Tribal 4(d) Rule. Information used to make this determination comes from the TRMP itself, from supporting materials supplied with the TRMP, and from other materials including the State of Oregon's 1998 application for a section 10 permit for the Imnaha River chinook salmon research and enhancement program (ODFW 1998) and the State of Oregon's Annual Operating Plan (AOP) (ODFW 2003) for Imnaha River chinook salmon research and enhancement.

The co-managers expect that the 2003 Imnaha chinook salmon return will be sufficient to meet natural spawner and hatchery broodstock needs, and to support limited tribal and recreational fisheries. The TRMP describes first how spawning escapement and hatchery broodstock needs would be met and then describes ceremonial and subsistence fisheries planned by the tribe and recreational fisheries planned by ODFW. The following provides a brief summary of the TRMP and sets the context for NOAA Fisheries' review.

The TRMP covers activities that affect Imnaha River spring/summer chinook salmon that are part of the threatened Snake River spring/summer chinook salmon Evolutionarily Significant Unit (ESU). The NPT and ODFW share management responsibility for these fish. The TRMP describes activities that are principally conducted by the Tribal government and activities that are principally conducted by the State through cooperative agreements. State fisheries are described in a letter from ODFW dated January 20, 2003 (ODFW 2003b) which is referenced in the TRMP. As per the Tribal 4(d) Rule, NOAA Fisheries consulted regularly with the Nez Perce Tribe on the content of the TRMP and on NOAA Fisheries' analysis and determination that provide for the conservation of listed species.

### **ESU Description and Geographic Range**

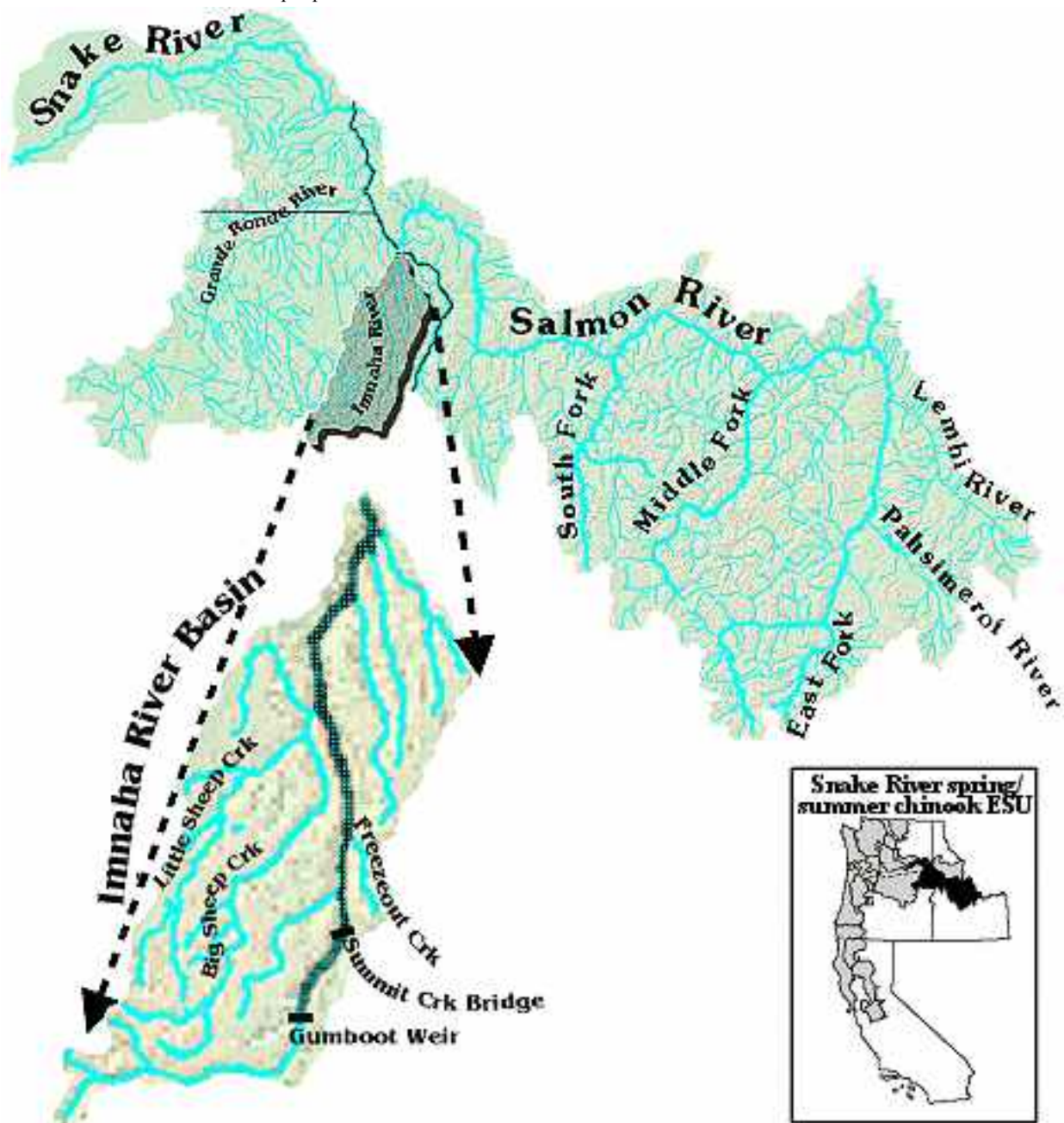
An ESU is defined as a distinct population segment of Pacific salmon that is: (1) substantially reproductively isolated from other conspecific units, and (2) represents an important component

of the evolutionary legacy of the species (Waples 1991). The number of fish in an ESU perpetuating themselves by natural reproduction is the measure of salmon health or recovery. A major component of the habitat that historically produced Snake River spring/summer chinook salmon has been blocked by dams. Important areas including the Powder, Weiser, Payette, Malheur, Boise, Owyhee, and Bruneau river subbasins no longer produce salmon. The Snake River spring/summer chinook salmon ESU includes fish produced in the Tucannon, Grande Ronde, Imnaha, and Salmon River. These salmon remain part of the ESU and listed when managers elect to use them in experiments with hatcheries to help boost the number of salmon perpetuating themselves in streams. Experiments like this involving spring/summer chinook salmon are underway in the Imnaha, Tucannon and Grande Ronde rivers, and at the Sawtooth, Pahsimeroi, and McCall hatcheries on the Salmon River. Full information on how the Imnaha River spring chinook salmon program is conducted, monitored, and evaluated, can be found in the biological opinion on the issuance of section 10(a)(1)(A) permit number 1128 (NMFS 2000).

Most adult Snake River spring/summer chinook salmon return to their subbasins of origin from May through September and spawn in August and September. Juvenile salmon emerge from spawning gravels between February and June. Typically, after rearing in their nursery streams for about one year, smolts migrate to the ocean in April and May. Upon entering the ocean, these fish are believed to use near shore areas before beginning a one to three year migration through the north Pacific Ocean. Adult fish (a mixture of three-, four-, and five- year-olds) return to the Columbia River in February through April to begin their upstream migration to spawning areas. Substantial scientific information has been compiled upon which to base management decisions relating to these fish and this information is easily accessible to the public (NMFS 1998, 2000).

NOAA Fisheries estimates that more than 1.5 million spring/summer chinook salmon returned to the Snake River annually prior to non-tribal settlement of the region (NMFS 1995). By the 1950s, annual returns had declined to an estimated 125,000 adults. Escapement estimates indicate that the population continued to decline through the 1970s. Returns were variable through the 1980s, but declined to the point that the ESU was listed as Threatened, under the ESA, in 1992. Record low returns of 1,721 and 1,116 fish were counted at Lower Granite Dam (the last dam that salmon pass before reaching the spawning grounds) in 1994 and 1995 and the ESU was briefly listed as Endangered. Returns were modestly higher in the late 1990's, and then increased dramatically in 2000, 2001, and 2002. The 2003 preseason run prediction is substantially lower than the peak return in 2001, but remains higher than the long term average. Table 5 reports the estimated annual return of natural-origin adult spring and summer chinook salmon produced from Snake River Basin streams.

Figure 1. The geographic range of the Snake Basin spring/summer chinook salmon ESU, including the location of the Imnaha River basin and the area of the proposed tribal ceremonial and subsistence and non-tribal recreational fisheries proposed for 2003.



The 2001 return of Columbia River spring chinook salmon produced in hatcheries was the largest ever recorded. Pre-season estimates of the 2003 run are lower, but still among the highest recently recorded. Because of the substantial numbers of young salmon released by hatcheries, adult returns can be extraordinarily large when favorable environmental conditions occur. Since ocean conditions in the past several years have been very favorable, the 2003 return of naturally-produced spring chinook salmon return is also expected to be moderately large, in spite of below average survival of emigrant smolts in 2001.

The Imnaha River is one of the drainages expected to receive an above-average return of both hatchery and naturally produced adult salmon in 2003. The 2003 projected returns of naturally produced and hatchery chinook salmon to the Imnaha River are 1,540 and 2,635 fish, respectively. Approximately 2,500 naturally produced spawners (fish that were produced in the river) is the preliminary abundance threshold for ESA delisting (Lohn 2002). NOAA Fisheries provided targets like this to help regional, state, tribal, and local planning and management authorities to gauge the level of effort that may be needed to recovery protected species. The Interior Columbia Technical Recovery Team (TRT) is working on other criteria relating to productivity, distribution, diversity, etc., which should be available in the near future. The Imnaha produced a return of 4,391 fish in 1957, the first year for which such estimates are available. In the 44 years since then, natural returns have exceeded 2,000 fish only five times (1960, 1971, 1973, 1978, and 2001). The 2001 return of 2,465 naturally-produced fish was produced primarily by 402 natural spawners in 1996 and 345 natural spawners in 1997. A spawner-to-spawner return ratio greater than 1:1 means the population is growing. Spawner-to-spawner ratios appear to be on the rise in the Imnaha. In 2000, 2.5 fish returned for every naturally produced spawner (ODFW 2001); the 2001 ratio was in the range of 6:1, and expectations are that spawner to spawner ratios will exceed 1:1 in 2002 and 2003.



Table 5. Estimates of natural-origin Snake River spring and summer chinook salmon at Lower Granite Dam, 1979-2003 (Speaks 2000; NPT 2003), compared to the aggregated interim abundance targets for natural-origin Snake River spring/summer chinook salmon passing Lower Granite Dam (Lohn 2002).

Year	Spring Chinook	Summer Chinook	Total
1979	2,573	2,712	5,285
1980	3,478	2,688	6,166
1981	7,941	3,326	11,267
1982	7,117	3,529	10,646
1983	6,181	3,233	9,414
1984	3,199	4,200	7,399
1985	5,245	3,196	8,441
1986	6,895	3,934	10,829
1987	7,883	2,414	10,297
1988	8,581	2,263	10,844
1989	3,029	2,350	5,379
1990	3,216	3,378	6,594
1991	2,206	2,814	5,020
1992	11,285	1,148	12,433
1993	6,008	3,959	9,967
1994	1,416	305	1,721
1995	745	371	1,116
1996	1,358	2,129	3,487
1997	1,434	6,458	7,892
1998	5,055	3,371	8,426
1999	1,433	1,843	3,276
2000	3,029	2,299	5,328
2001	16,477	2,400	18,877
2002	24,300	4,800	29,100
2003 <sup>1</sup>	13,043	5,299	18,342
Interim Abundance Target			40,900

<sup>1</sup> preseason estimate, 3/15/03

The there has been measured improvement in Snake River spring/summer chinook salmon returns, and for the Imnaha River in particular over the past three years.

**Description of the Fisheries and the Estimated Take of Protected Fish**

The fisheries proposed for 2003 and the projected take of protected spring/summer chinook salmon are described in the NPT's TRMP (NPT 2003). The NPT plans to conduct ceremonial and subsistence fisheries and to cooperate with ODFW to open recreational fisheries during 2003 very similar to fisheries conducted in 2001 and 2002.

The proposed fisheries are limited to specific sites and times within the Imnaha River subbasin and include: (1) fisheries for tribal members until July 31 (under tribal regulations) in the mainstem Imnaha, from its confluence with the Snake River upstream to within 60 feet of the hatchery weir, and (2) recreational fisheries for non-tribal members until June 30 (under state of Oregon regulations) in the mainstem Imnaha from its confluence with the Snake River upstream to the Summit Creek Bridge, as described in the 2003 AOP, Attachment A (ODFW 2003). Figure 1 includes the landmarks used for regulation purposes.

Tribal regulations allow the use of traditional fishing methods (dip net, gaff, longbow and spear) and hook and line. Because some of the traditional tribal methods are lethal, harvest is not selective and is assumed to affect all components of the run equally. Recreational anglers must use hook and line under state regulations (the standard practice). Only hatchery-origin salmon that have been marked by a clipped adipose fin may be retained by recreational fishers and unclipped fish must be returned to the water unharmed. Some harvest methods practiced by the Tribe do not allow the release of fish unharmed.

The ODFW estimates that non-tribal fishers harvested 302 marked hatchery-produced chinook salmon in 2001; in addition, an estimated 21 marked fish and 433 unmarked fish were caught and released. In 2002, the ODFW estimated 140 marked hatchery-produced chinook salmon were harvested while 6 marked fish and 12 unmarked fish were caught and released. The NPT estimates that tribal fishers harvested 23 unmarked chinook salmon in 2001. In 2002, tribal fishers harvested 196 marked fish and 47 unmarked fish for a total of 243.

The ODFW estimates fishery impacts based on available information for similar fisheries. Recreational fisheries were open on the Imnaha River between 1957 and 1978 and, with the exception of one year, an average of 2.3% of the estimated escapement was harvested annually (ODFW 2003). The recreational fishery conducted in 2001 harvested 8% of the hatchery-origin escapement and incidentally killed about 1.7% of the estimated natural escapement. Anglers were unusually successful in 2001 because of low water levels and early arrival of the migrating salmon. In 2002, which is reported as a more typical water-year, anglers harvested 4% of the hatchery-origin escapement and incidental mortality is estimated at 0.1% of the natural-origin escapement.

To estimate potential impacts of the 2003 fishery, ODFW considered the 2.3% historical average harvest as the expected impact and 10% (the highest historical harvest rate) as the maximum

impact. This range brackets the recently observed impact of 8% in 2001 and 4% in 2002 (Table 6.)

Table 6. Projected hatchery chinook salmon harvest and incidental mortality of natural origin chinook salmon in the 2003 Imnaha River recreational fishery, assuming 10% catch-and-release mortality rate (see text).

<b>Hatchery Fish Harvest Rate</b>	<b>Hatchery Fish Harvested</b>	<b>Natural Origin Fish Caught and Released</b>	<b>Incidental Mortality of Natural Fish</b>	<b>Percent of Estimated Natural Return</b>	<b>Escapement after Fishery (H+W)</b>
2003@ 2.3% (expected)	61	35	4	0.26%	4,100 (2,574+1,536)
2003@10.0% (maximum)	264	154	16	1.04%	3,895 (2,371+1,524)

The NPT estimates the impacts of the tribal fishery based on a simple harvest quota. The recent two years of harvest monitoring indicate variable participation and success of tribal anglers and data is not yet sufficient to predict trends and impacts.

The hatchery program in the Imnaha River subbasin has been releasing fish since 1982. The ratio of hatchery-origin to natural-origin salmon in the 2003 return is predicted to be 2,635 to 1,540, or approximately 63% hatchery and 37% natural origin (including 3-year-old “jacks”). The TRMP proposes an overall harvest quota of 418 adult and jack chinook salmon (88 natural origin and 330 hatchery origin) in 2003, based on a 10% total harvest rate divided evenly between the state-managed recreational fishery and the treaty tribal fishery (retention of 209 fish each). Beginning in 1996, hatchery fish have been marked by removal of the adipose fin, and all hatchery produced fish returning to the Imnaha this year are identifiable by the missing adipose fin. The tribal fishery is expected to harvest 209 fish, approximately in the same 37:63 ratio that they are predicted to occur, or about 77 unmarked natural fish and 132 hatchery fish. The state fishery is selective for marked fish – recreational anglers are required to release unmarked salmon that are caught in the Imnaha River, with incidental mortality due to catch-and-release of natural origin fish (the mortality of adult fish incidental to catch and live release is assumed to be 10% of the catch-and-release portion of the harvest, though this value is likely high and therefore conservative (NOAA Fisheries 2003)). To avoid exceeding their quota of 209 natural fish, the recreational fishery is proposed to close after the harvest of 198 marked, hatchery-produced chinook salmon, or a harvest rate of .075 of the hatchery return. If the natural return is also handled at the .075 rate, 115 natural fish would be caught and released by anglers and 11 fish would be expected to die after release due to injury (at 10% per capture hook-and-release mortality). In total, 192 natural spring/summer chinook salmon would be handled in the fisheries, with fishery mortalities projected to be 88 of the 1,540 natural spring/summer chinook salmon returning to the Imnaha in 2003 (77 by the tribal fishery, 11 by the recreational). This amounts to less than six percent of the predicted return of natural-origin spawners. Total

hatchery-origin harvest is estimated at 330, or approximately 12.5 % of the predicted return of 2,635.

## EVALUATION

The final 4(d) Rule for tribal resource management plans states that the prohibitions of section 223.203(a) of the Rule (16 U.S.C. 1531-1543) do not apply to actions undertaken by a tribe in compliance with a Tribal resource management plan provided that:

1. The Secretary has determined pursuant to 50 CFR 223.209 and the government-to-government processes described therein that implementing the plan will not appreciably reduce the likelihood of survival and recovery of the listed salmonids.
2. In making that determination, the Secretary has taken comment from the public on the Secretary's pending determination.
3. The tribal plan must specify the procedures by which the tribe will enforce its provisions.

As per the Rule, NOAA Fisheries consulted regularly with the Nez Perce Tribe during the development of the TRMP through government-to-government and staff level communications. These occasions provided the opportunity to provide technical assistance, exchange information, and discuss what would be needed to provide for the conservation of the listed species and to be consistent with legally enforceable tribal rights and with the Secretary's trust responsibilities to the tribes.

The following is an evaluation of whether the TRMP adequately addresses the criteria specified in §223.209.

### **Application of Fisheries Limit Criteria**

NOAA Fisheries has evaluated the TRMP submitted by the NPT to determine whether actions taken under the TRMP would appreciably reduce the likelihood of survival and recovery of the affected listed ESU. At NOAA Fisheries' request, the NPT provided the TRMP in the format that NOAA Fisheries developed for evaluating Fisheries Management and Evaluation Plans (FMEPs) under Limit 4 and Limit 6 of the July 10, 2000, 4(d) Rule (65 FR 42422). Limit 4 involves nine criteria that not only describe a fishery but also provide a sound basis for evaluating any biological consequences from conducting the fishery. These criteria were developed under a separate Rule to cover state fisheries and joint state-tribal plans under ongoing Federal court jurisdiction, but they also provide a useful framework for assessing the impacts of TRMPs. NOAA Fisheries' evaluation of the NPT TRMP is detailed below.

**4(d) Fishery Limit Criteria - from CFR 223.203**

In considering the effects of this TRMP on listed species, NOAA Fisheries took into account the following criteria for state FMEPs under Limit 4 and joint state-tribal plans under Limit 6 of the final ESA section 4(d) Rule.

***Section 4 (i)******- Clearly defines the scope and area of impact***

The scope of the TRMP is clearly defined, and involves only fishery impacts on spring/summer chinook salmon in the Imnaha River during 2003. The TRMP addresses the allocation of adult salmon among different beneficial uses, including natural spawning, brood stock collection that supports an experimental hatchery program designed to aid in the recovery of this population, the release of adult spawners into under-utilized spawning habitat within the Imnaha River subbasin, and harvest.

***- Sets management objectives and performance indicators for the plan***

The TRMP integrates fishery decisions into implementation of the hatchery program and management of salmon returns at the subbasin level. TRMP management objectives are to achieve hatchery brood stock collection needs, adult salmon reintroduction objectives, and appropriate proportions of natural and hatchery salmon on the spawning grounds as described in the Annual Operating Plan (AOP) for the hatchery program (ODFW 2003). The escapement and composition of chinook salmon on the spawning grounds is managed in accordance with a sliding scale that addresses the inter-annual variation in total run size and the proportion of natural and hatchery-origin fish in the return. Performance indicators include dam, weir and redd counts, harvest estimates, escapements, and spawner to spawner ratios for hatchery and natural salmon.

***Section 4(i)(A) - Define populations within affected listed ESUs, taking into account spatial and temporal distribution, genetic and phenotypic diversity, and other appropriate identifiably unique biological and life history traits.***

Imnaha River spring chinook salmon are the only affected group of 39 sub-populations considered to comprise the Snake River spring/summer chinook salmon ESU. The actions described in the TRMP occur only within the Imnaha River subbasin, and during a time period when only spring/summer chinook salmon are expected to be present.

The artificial propagation program for Imnaha spring chinook salmon is operated specifically to address both demographic and genetic risks, and to minimize the chance of domestication selection. Management protocols require that hatchery and natural fish are incorporated (in appropriate proportions) into both the natural spawning and hatchery broodstock components.

The tribal and recreational fisheries are managed within the context of continuing to achieve artificial propagation and natural spawning escapement objectives.

***Section 4(i)(B) - Utilize the concepts of “viable” and “critical” salmonid population thresholds, consistent with the concepts contained in the technical document entitled Viable Salmonid Populations (NMFS 2000)***

The Viable Salmonid Population paper (VSP) (McElhany *et al.* 2000) describes viable and critical levels for salmonid populations in terms of population abundance, population growth rate, spatial structure and diversity. The NPT and ODFW have analyzed the total abundance, population trends, and occupation of habitat as surrogates for the VSP criteria to make judgements relative to the viability of the population (ODFW 1998). NOAA Fisheries’ review of Imnaha spring/summer chinook salmon status based on available information is presented below.

**Population Abundance**

Annual escapements of spring/summer chinook salmon produced in the Imnaha River subbasin are reported in Table 4. The 2003 projected return of over 1,540 naturally produced chinook salmon would be the second highest natural return since 1990. The total predicted 2003 return is somewhat fewer fish than returned in 2001 and 2002, but still exceeds adult returns in all but 3 of the past 44 years.

The number of salmon produced in Snake River tributaries, without dependence on hatcheries to produce fish, is one of several considerations in determining when these fish can be removed from the ESA list. NOAA Fisheries first identified delisting criteria for Snake River spring/summer chinook salmon in 1995 (NMFS 1995). More recently, NOAA Fisheries has formed a Technical Recovery Team which has begun work to establish delisting criteria for salmon in various Columbia River tributaries including the Imnaha River. NOAA Fisheries issued an interim abundance target of 2,500 natural-origin spawners for the Imnaha River (Lohn 2002). The predicted 2003 return of 1,540 natural-origin recruits to the Imnaha River is lower than the interim abundance target. However, the 2003 prediction exceeds the recent 5-year average of 970 recruits by about 60%. Future evaluation of activities in the Imnaha River subbasin will include consideration of these targets. Implementation of the TRMP is not expected to appreciably reduce the likelihood of meeting this abundance target in the future and will play an important role in putting hatchery-origin fish surplus to spawning ground and experimental propagation broodstock needs to good use. Where self-perpetuating salmon is a goal (as it is in the Imnaha River subbasin), the proportion of fish from experimental hatchery programs on the spawning grounds must be carefully managed.

**Population Growth Rate**

The key criterion for population growth rate is the spawner:spawner ratio or cohort-replacement ratio. Specifically, there must be sufficient productivity from the naturally produced spawners to maintain the population at or above viability thresholds in the absence of the hatchery subsidy.

As an example, NOAA Fisheries has identified criteria that include a natural cohort replacement rate over an 8-year geometric mean exceeding 1.0 (NMFS 1995; Lohn 2002). Fisheries described in the TRMP would not result in a sizable decrease in replacement rate which, after fisheries, would still be expected to be in excess of 1:1 for the 1998-2000 brood years.

A 1:1 spawner:spawner replacement rate means a population is stable (not growing or declining). The most up-to-date available information is for brood year 1995, which returned as 4- and 5-year-olds in 1999 and 2000 with a cohort-replacement ratio of 2.5:1 for natural spawners (ODFW 2001). The 1996 brood year, which returned as 4-year-olds in 2000, and as 5-year-old fish in the 2001 run, appears to have a cohort replacement rate in excess of 2.0:1. The 1997 year class that returned as 4-year-olds in 2001 and 5-year-olds in 2002 may have a replacement ratio exceeding 6.0:1. The return of brood year 1998 fish, will not be complete until the 5-year olds are counted in 2003; however, jack counts in the 2001 run and the return of 4-year olds in 2002 exceeded the parent return of 196 natural spawners in 1998. The 2003 return will consist of progeny of 1998, 1999, and 2000 brood years. Three or four consecutive brood-years with spawner:spawner ratios in excess of 1:1 is an indicator of population growth and viability.

### **Spatial Structure**

It is possible for fisheries to affect the spatial structure of a population and/or ESU. For example, a fishery could target a certain portion of the run, which may result in a substantial decrease in the number of spawners destined to a particular spawning location or population through time (e.g., the early portion of a run of salmon may be the fish that migrate the furthest upstream). If the fishery harvests the early returns, the spawning distribution of a population may change.

NOAA Fisheries expects that spring/summer chinook salmon will be well distributed throughout the Imnaha River subbasin in 2003. Whether fish from the Imnaha population will be induced to stray by population pressures within the Imnaha River subbasin is unknown. There is no indication that the large number of Imnaha returnees since 2001 has resulted in increased straying into other Snake River tributaries. The planned harvest of 88 of 1,540 natural-origin spring/summer chinook salmon returning to the Imnaha River is unlikely to have a measurable effect on the spatial distribution of spawners within or outside the Imnaha River subbasin. Both tribal and non-tribal fisheries will occur in the mainstem Imnaha River, not in Sheep Creek or other tributaries in which natural spawning occurs, so as to focus on an area dominated by hatchery-produced fish.

### **Diversity**

The criterion for viable population diversity dictates that human caused factors, including harvest and artificial propagation, should not substantially alter variation in genetic or phenotypic diversity or substantially alter the rate of gene flow among populations. The Imnaha River artificial propagation program attempts to avoid both demographic and genetic risks, and to minimize the chance of domestication selection. The brood stock management protocol ensures

that hatchery and natural fish are incorporated into both the natural spawning and hatchery components. Marking of all hatchery releases eliminates the possibility of masking effects of hatchery fish on natural populations and facilitates the evaluation of the program's impacts and progress.

Implementation of the fishery would remove 88 of 1,540 fish or less than 6% of the naturally produced spawning population. The effects of proposed fisheries are expected to be uniformly and proportionally distributed across the entire return to the Imnaha River in 2003 and do not selectively target any particular component of the return by age, sex, size, or run timing. The fisheries are designed within the context of the artificial propagation program and natural spawning escapement goals, and so would not affect the program's broodstock management protocol. These fisheries are unlikely to have any effect on the genetic or phenotypic diversity of chinook salmon within the Imnaha River subbasin.

***Section 4(i)(C) - Set escapement objectives or maximum exploitation rates for each management unit or population based on its status and on a harvest program that assures that those rates or objectives are not exceeded.***

The average escapement to the Imnaha River between 1957 and 1967 was approximately 1,560 natural origin fish (ODFW 2001). The pre-1970 average redd counts for the Imnaha River, Big Sheep Creek and Lick Creek trend areas was 321 redds (NMFS 1995). In the past 13 years of record (since 1990), the mean spawning escapement has been 1,091 hatchery-origin salmon and 523 natural-origin salmon or 1,614 total spawners. In 2003, the TRMP projects that approximately 1,540 naturally produced spring/summer chinook salmon will return to the Imnaha River, comparable to the 1957-1967 10-year average and higher than the average over the last 13 years (Table 3). After hatchery brood stock collection, adult outplanting, and planned fisheries, approximately 1,378 are expected to survive to spawn (Table 7). While there is no single agreed-upon escapement objective for the Imnaha, some work has been done to establish what that level for spring/summer chinook salmon should be. The Columbia Basin Fish and Wildlife Authority Subbasin Planning Process set a goal in 1990 of 3,820 naturally spawning fish (Nez Perce Tribe et al. 1990). The Columbia River Treaty Tribes' Tribal Recovery Plan (Wy-Kan-Ush-Mi Wa-Kish-Wit) (CRITFC 1995) proposed a goal of 3,800 naturally spawning fish. On April 4, 2002, NOAA Fisheries issued an interim abundance target for the Imnaha sub-basin of 2,500 nature origin spawners (Lohn 2002). It is important to note that this target provides only preliminary guidance for the minimum levels of abundance and productivity that may be needed for delisting under the ESA – management objectives for the population may be greater than this abundance level. It is also important to note that NOAA Fisheries' recovery goals and interim abundance targets are calculated in terms of natural origin spawners, while the other goals are measured as the total numbers of fish on the spawning grounds (i.e., naturally spawning) without regard for natural or hatchery origin.

The TRMP sets both escapement objectives and a maximum exploitation rate for the Imnaha chinook salmon population. Consistent with the sliding scale management strategy resulting



Table 7. Projected distribution of spring/summer chinook salmon returning to the Imnaha River in 2003 (includes jacks and adults) (NPT 2003).

Area	Natural	Hatchery	Total
To River Mouth	1,540	2,635	4,175
Harvest	88	330	418
Number of fish post harvest	1,452	2,305	3,757
To Weir (65% of post harvest return)	944	1,498	2,442
Hatchery Broodstock	74	170	244
Outplant to Big Sheep and Lick Cr.	0	300	300
Spawning Upstream of Weir <sup>1</sup>	870	1,028	1,898
Spawning Downstream of Weir (35% of post harvest return)	508	807	1,315
Total Natural Spawning (mainstem and tributaries)	1,378	2,135	3,513

<sup>1</sup> Two additional criteria from Table 2 are likely to reduce the number of hatchery-origin spawners above the weir: First, the proportion of hatchery-origin fish released above the weir is not to exceed 50% and second, no more than 10% of the male salmon released above the weir may be hatchery-origin jacks. Excess jacks or adults may be added to the Big Sheep Creek release.

from the 1993 *U.S. v. Oregon* dispute resolution, and described in the section 10 Permit application, the NPT and ODFW have determined that the anticipated adult escapement for 2003 is sufficient to meet natural spawner and hatchery brood stock goals as well as support tribal and non-tribal fisheries. The projected escapement (after hatchery broodstock collection, adult outplanting, and planned fisheries) of 1,378 natural origin spring/summer chinook salmon in 2003 exceeds all but one of the past 13 years and is in the top 25% of escapements since 1957 (NPT 2003). Table 7 summarizes the allocation among spawning escapements, hatchery brood stock, and harvest proposed for 2003.

***Section 4(i)(D) - Display a biologically based rationale demonstrating that the harvest management strategy will not appreciably reduce the likelihood of survival and recovery of the ESU in the wild, over the entire period of time the proposed harvest management strategy affects the population, including effects reasonably certain to occur after the proposed actions cease.***

NOAA Fisheries assesses the effects of the proposed fishery on the four VSP parameters previously in this document in Section 4(i)(B). In summary, the available information for Imnaha River spring/summer chinook salmon indicates that the Population Abundance of natural-origin fish has increased in recent years; the Population Growth Rate has been greater than 1:1 for parent-to-progeny ratios in recent years; the fisheries should have little or no effect on the Spatial Structure of naturally spawning fish; and there will be minimal effects on Imnaha River chinook salmon Diversity.

As discussed above under section 4(i)(C), the TRMP describes actions that assure that spawning escapements, hatchery brood stock requirements, and supplemental adult releases would be achieved in accordance with the annual operating plan (ODFW 2003). The TRMP proposes fisheries that would be limited to a 6% impact on the target population (natural origin fish) in a year of above-average returns. Natural-origin fish on the spawning grounds are still predicted to be approximately 60% of the preliminary delisting abundance targets, and escapement will exceed the long-term averages for this population with the fisheries implemented. The cohort replacement rate is expected to be in excess of 1:1 for the 1998-2000 brood years (the brood years that will produce this year's adult returns). The proposed fishery would have minor effect of the replacement rate and therefore is not expected to appreciably reduce the likelihood of meeting viability targets in the future.

***Section 4(i)(E) - Include effective monitoring and evaluation programs to assess compliance, effectiveness, and parameter validation. At a minimum, harvest monitoring programs must collect catch and effort data, information on escapements, and information on biological characteristics, such as age, fecundity, size and sex data, and migration timing.***

In-season monitoring and reporting is required to track the fisheries and assess, in a timely fashion, whether the fisheries are following expectations or exceeding catch limitations specified in the TRMP. A combination of techniques including mandatory reporting, reporting stations, catch cards, and creel census monitoring would be utilized to monitor and evaluate fishing effort. Estimates of harvest and fishing effort would be made and reported weekly. Conservation enforcement officers would conduct catch monitoring and enforce compliance with fishing regulations. In-season reports on the fishery will be provided to NOAA Fisheries biweekly, and a final report provided within 90 days of the end of the fishery. The reports will include the composition and number of salmon harvested, the composition and number of fish trapped and sampled at the hatchery weir, estimated harvest effort, and composition and number of salmon caught and released. The reports would also include information on illegal fishery activity, including illegal (inadvertent and overt) harvest, numbers of fish involved, and enforcement response. The final report would include additional abundance information, such as final Lower Granite Dam counts, redd counts, and information from carcass surveys.

Monitoring information would be used to estimate different fishery parameters including harvest, catch composition, and participation. Dam counts and tag detections at mainstem Columbia and Snake River dams would be used to update Snake River spring/summer chinook salmon return information. Refinement of Imnaha returns may be possible from PIT tag detections at the dams. In-season inventory of salmon returns to the Gumboot weir would be used to confirm run size and composition. All activities described in the TRMP are contained within the Imnaha River subbasin, where fishers are limited to a few access roads. ODFW reports that between 20 and 25% of the estimated harvest was physically checked during the creel census and 10 to 15 % was observed by enforcement checks. Nez Perce Tribe and ODFW estimate that 60 to 65% of the total run passes the hatchery weir site where an average of 44% of the total run is captured, enumerated and biological data is collected. Spawning ground surveys cover virtually the entire

length of the Imnaha river and tributaries. Redd counts and carcass surveys provide additional data on spawner abundance, distribution and composition by age and origin. This high sampling rate for estimating run size and composition and for estimating fishery parameters contributes to accurate monitoring. Fisheries conducted the previous two years have been conducted within the level of impacts assessed in previous Imnaha River TRMP's.

***Section 4 (i)(F) - Provide for evaluating monitoring data and making any revisions of assumptions, management strategies, or objectives that data show are needed.***

As noted under section 4(i)(E), above, co-managers will evaluate fishery monitoring data, dam counts and weir capture data weekly to verify assumptions, refine management strategies, and adjust management actions to ensure that escapement goals are attained and harvest quotas are not exceeded. The state recreational fisheries would terminate when the monitoring information indicates that 198 hatchery fish have been harvested or incidental handling of natural fish exceeds 115. The tribal fishery would terminate when monitoring shows that 209 chinook salmon have been harvested.

***Section 4(i)(G) - Provide for effective enforcement and education. Coordination among involved jurisdictions is an important element....***

State and Tribal wildlife enforcement officers will be present within the fishery areas making contact with fishers to check compliance with regulations and collecting random creel census information. Organized statistical creel census increases the interaction between the managers, enforcement staff, and fishers, thereby providing opportunities for communication and educational contact with the fishers. The estimated contact rate with participants in the fishery and the proportion of the harvest checked is 40%.

***Section 4(i)(H) - Include restrictions on resident and anadromous species fisheries that minimize any take of listed species, including time, size, gear, and area restrictions.***

Bull trout is a species that may be affected by the actions taken under the NPT TRMP for the Imnaha River subbasin spring chinook salmon. In the 4(d) Rule issued at the time of bull trout listing, the U.S. Fish and Wildlife Service found that State and Tribal fishing regulations are adequate to protect bull trout from excessive taking and therefore it is not necessary to prohibit take incidental to or in accordance with State and Native American Tribal fish and wildlife conservation laws (June 10, 1998, 63 FR 31647 [50 CFR 17.44(w)]).

No listed adult steelhead or fall chinook salmon are expected to be present in the Imnaha River subbasin during the period of the actions described under the TRMP. State and Tribal conservation regulations are designed to be protective of resident fish species. The regulations for the fisheries proposed under the TRMP are specifically designed to protect listed species and limit harvest to specified quotas.

***Section 4(i)(I) - Be consistent with plans and conditions established within any Federal court proceeding with continuing jurisdiction over tribal harvest allocations.***

As parties to *U.S. v. Oregon*, the NPT and ODFW are under standing court orders obligating them to “exercise their sovereign powers in a coordinated and systematic manner in order to protect, rebuild, and enhance upper Columbia River fish runs while providing harvests for both treaty Indian and non-Indian fisheries” (*U.S. v. Oregon*, Civ. No. 68-513 KI (D. Oregon)). The NPT worked with its *U.S. v. Oregon* co-managers to develop this TRMP, which includes elements of cooperative agreements between the Tribe and State (ODFW 2003a; ODFW 1998). The NPT has developed this plan to meet the conservation needs of the protected chinook salmon population while also providing for tribal fishing opportunity.

**Notice of Pending Recommendation**

As required by the Tribal 4(d) Rule, the Secretary is making available for public review his pending determination as to whether the TRMP would appreciably reduce the likelihood of survival and recovery of the listed salmonids.

**Notice of Recommended Determination**

As required in (b)(4) of section 223.209 of the ESA Tribal 4(d) Rule, the Secretary will publish notice of his determination as to whether the TRMP appreciably reduces the likelihood of survival and recovery of affected threatened ESUs, together with a discussion of the biological analysis underlying that determination.

**PENDING DETERMINATION**

NOAA Fisheries has reviewed the NPT TRMP and evaluated it against the requirements of the Tribal 4(d) Rule and in light of additional considerations specific to the Imnaha River Spring chinook salmon return in 2003. Based on this review and evaluation, NOAA Fisheries’ pending determination is that the fisheries implemented as defined in the NPT TRMP will not appreciably reduce the likelihood of survival and recovery of Snake River spring/summer chinook salmon. This conclusion is based on the following information:

- There is an increasing trend in the population of natural origin spring/summer chinook salmon returning to the Imnaha River (refer to Table 4 and Section 4(i)(B), Population Abundance).
- The parent-to-progeny replacement rate for Imnaha River natural origin spring/summer chinook salmon will remain substantially above replacement levels in 2003 (see discussion in Section 4(i)(B), Population Growth Rate and Section 4(i)(D)).
- The fishery is not expected to alter the distribution of naturally spawning spring/summer chinook salmon (see discussion in Section 4(i)(B), Spatial Structure).

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- The fishery will have minimal effect on Imnaha River spring/summer chinook salmon (see Section 4(i)(B), Diversity).

Pending consideration of comments received, the Northwest Region Salmon Recovery Division expects to recommend a finding that implementation of tribal and recreational fisheries in 2003 as specified in the TRMP is consistent with the July 10, 2000, ESA Tribal 4(d) Rule.

**Reevaluation Criteria**

NOAA Fisheries will reevaluate this determination if: (1) the quota for incidental harvest of listed fish is exceeded; (2) the actions described by the TRMP are modified in a way that causes an effect on the listed species that was not previously considered in NOAA Fisheries' evaluation; (3) new information or monitoring reveals effects that may affect listed species in a way not previously considered; or (4) a new species is listed or critical habitat is designated that may affect NOAA Fisheries' evaluation of the TRMP.

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**References**

**Federal Register Publications**

- June 10, 1998 (63 FR 31647) Final Rule; Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Klamath River and Columbia River Distinct Populations Segments of Bull Trout. U.S. Fish and Wildlife Service, Department of the Interior.
- July 10, 2000 (65 FR 42422). Final Rule: Endangered and Threatened Species; Final Rule Governing Take of 14 Threatened Salmon and Steelhead Evolutionarily Significant Units (ESUs).
- July 10, 2000 (65 FR 42481). Final Rule: Endangered and Threatened Species; Final Rule Governing Take of Threatened Salmon and Steelhead For Actions Under Tribal Resource Management Plans.

**Literature Cited**

- CRITFC (Columbia River Inter-Tribal Fish Commission). 1995. *Wy-Kan-Ush-Mi Wa-Kish-Wit: Spirit of the Salmon*. The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakama Tribes. Columbia River Inter-Tribal Fish Commission. Portland, Oregon.
- Lohn, D.R. 2002. Letter to Frank L. Cassidy Jr. Chairman, Northwest Power Planning Council, with attachment: "Interim Abundance and Productivity Targets for Pacific Salmon and Steelhead listed under the Endangered Species Act in the Interior Columbia Basin." April 4, 2002. 10p.
- McElhany, P., M.H. Ruckelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-42. 156p.
- NMFS (National Marine Fisheries Service). 1995. Proposed Recovery Plan for Snake River Salmon. NMFS, Portland, Oregon. March 1995.
- NMFS. 1998. Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-35. February 1998.
- NMFS. 2000. Section 10 (a)(1)(A) Permit for takes of Endangered/Threatened Species. Number 1128; Scientific Research and Enhancement. September 21, 2000.

- NOAA Fisheries. 2003. Biological opinion on issuance of modification 1 to section 10(a)(1)(B) incidental take permit 1233, for recreational fisheries management by the Idaho Department of Fish and Game. December 6, 2002.
- NPT (Nez Perce Tribe). 2001. Nez Perce Tribal Management Plan for Snake River spring/summer chinook salmon in 2001. Submitted to NMFS April 30, 2001.
- NPT. 2003. Nez Perce Tribal Management Plan for Snake River Spring/Summer Chinook Salmon in 2003. Submitted to NMFS - NWR by the Nez Perce Tribe, March 18, 2003.
- NPT, Confederated Tribes of the Umatilla Indian Reservation, and Oregon Department of Fish and Wildlife. 1990. Imnaha Subbasin Salmon and Steelhead Production Plan. Columbia Basin Fish and Wildlife Authority. Portland, Oregon.
- ODFW (Oregon Department of Fish and Wildlife). 1998. Application for a permit for scientific research and to enhance the propagation or survival of Imnaha River chinook salmon *Oncorhynchus tshawytscha* under the Endangered Species Act of 1973. Oregon Department of Fish and Wildlife. LaGrande, Oregon.
- ODFW. 2001. 2000 Annual Report for Endangered Species Permit No. 1128, ODFW Fish Research and Development. LaGrande, Oregon. 20p. plus appendices. April 16, 2001.
- ODFW. 2003a. Annual Operating Plan for the Imnaha River Scientific Research and Enhancement project, including Attachment A. Proposed sport fishery for hatchery spring chinook in the Imnaha River, 2003. Oregon Department of Fish and Wildlife, Northeast Region. LaGrande, Oregon.
- ODFW. 2003b. Proposed sport fishery for hatchery spring chinook in the Imnaha River, 2003. Oregon Department of Fish and Wildlife, Northeast Region. LaGrande, Oregon.
- Parker, S. 1997. Memorandum regarding Imnaha spring chinook escapement estimates. December 19, 1997. Oregon Department of Fish and Wildlife. LaGrande, Oregon.
- Speaks, S. 2000. Letter to Donna Darm, NMFS re: consultation concerning impacts of proposed 2001 Treaty Indian Fisheries (January 1 - July 31, 2001) in the Columbia River Basin on salmon species listed under the ESA. December 2000. 10p. with attached biological assessment.
- U.S. v. Oregon parties*. 1988. Columbia River Fish Management Plan. 699 F. Supp. 1456.
- Waples, R.S. 1991. Pacific Salmon, *Oncorhynchus* spp., and the definition of “species” under the Endangered Species Act. Mar. Fish. Rev. 53(3): 11-22.